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Studies C-1

Forest Insect Laboratory
Coeur d'Alene, Idaho
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MEMORANDUM FOR LABORATORY FILES

Re: Screening Lodgepole Pine to Prevent Attacks
of the Mountain Pine Beetle, 1933-1937

In areas where the mountain pine beetle is destroying lodgepole pine the protection of trees of high aesthetic value is an important problem. Possible solution seemed to lie in protecting the lower bole of the tree, which had been observed to be the portion initially attacked. It was thought repelling invasion of that portion of the tree might prevent any attack, and on that basis a series of sprays and coatings were applied. None of these were effective, but a mechanical barrier in the form of screen gave promise of success. The screen was applied as a loose-fitting sleeve fastened at the top and bottom by loops of wire twisted against the bark. The seam of the sleeve was made tight by overlapping the edges and fastening them with laths, placed under and over the seam, by means of shingle nails. The unscreened root collar of the tree was covered with dirt until it overlapped the lower edge of the screen.

In 1933 nine green lodgepole pine were screened as follows: 3 to 10 feet, 3 to 15 feet, and 3 to 20 feet above the ground, using 14-mesh galvanized screening. One of these trees was later killed by nine mountain pine beetle attacks and a "fill-in" of ^{secondary} insects, which had gained entrance because of the contraction of the screen pulling it loose and exposing the base of the tree.

The successful protection of the remaining trees warranted enlarging the experiment in 1934 by the screening of 25 of the larger valuable lodgepole pine remaining around the Elkhorn Hot Springs resort on the Beaverhead Forest. More protection was given by screening them to a greater height than in the previous experiment. Only one tree was screened to less than 20 feet, with the others averaging 22.3 and a maximum of 30 feet. The height screened was increased with the larger-diameter lodgepole pine, previous studies having shown such trees were initially attacked at a greater height and subsequent "fill-in" extended higher than on the smaller ones.

In the two years following screening two of the trees were observed to have a few attacks by the mountain pine beetle and secondary insects both above the screen and where rain had washed the dirt from the base of the tree, but they were too few to overcome the trees. In 1936 no attacks were noted, in spite of unfavorable environmental conditions for the screened trees. The large amount of insect-killed timber has been removed from the area adjoining most of the screened trees, and the latter are now the larger and often isolated survivors of a formerly moderately dense stand. This undoubtedly brings changes in environmental conditions generally unfavorable to the survival of such mature trees.

In 1937, one of the trees, which had evidently been weakened by road-fill piled against it, succumbed to the attack of small secondary bark beetles which had apparently either forced their way between the wires of the 14-mesh screen or had taken advantage of the loosening

of the screen in a few places adjoining a cat-faced area of the tree. An unusual feature was the finding of larvae of the larger woodborers under part of the screen where it had been drawn tightly against the bark. There was insufficient room under the screen for the movement of any but the tiny secondary bark beetles, leaving it necessary to conclude that the parent beetles laid their eggs through the screen.

Activity of the mountain pine beetle having decreased to a very small amount on the Beaverhead Forest, preventing further adequate test of the method, 27 more trees were screened in 1935 near Antelope Flat on the Targhee Forest, where an active infestation was developing.

Subsequent examination of the area showed only two attacks had occurred in 1935, one on the inside of the screen of one tree, probably enclosed at the time of screening, and the second above the screen on another tree. This immunity persisted in spite of the fact that the north part of the screened group was in the midst of 29 trees attacked subsequent to the screening in 1935. Since that year very few trees, adjoining those screened, have been attacked, although nearby areas have suffered a heavy loss. As on the Beaverhead Forest, the infestation is showing a decided decline on the Targhee Forest, giving no further adequate test of the method.

The experience on the three areas indicates the use of screen is effective in preventing attack, but in every case the method has not been subjected to as severe a test as is considered necessary to make a definite statement concerning its effectiveness.

It is hoped that in the near future a similar experiment can be conducted on an area of active infestation and thus give the method an exhaustive test.

Respectfully submitted,

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